Space Weather Forecast

Issued on Sunday, 27 August 2023 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares (R1-R2 Blackouts). Weak coronal mass ejection arrival possible day 4 (30 Aug) with slight chance of G1 Minor Storms.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: One Moderate flare was observed peaking 26/2250 UTC from an uncertain source over the east limb. There are five sunspot regions on the disc. Three of which are small and mature, however there are two visible sunspot groups of interest at this time. One in the southeast remains the most complex but has remained largely inactive. The larger spot near centre disk has maintained complexity around its dominant spot, perhaps indicative of a slightly increased flare potential.

A CME from a common class flare on the 25th has been analysed as likely containing an Earth-directed component, but very faint, with a glancing impact modelled for sometime day 4 (30 Aug), however confidence is low with any potential impacts.

Solar Wind / Geomagnetic Activity: Observed solar winds were at background to slightly elevated levels, with a slow reduction from around 450km/s to 380km/s, though with recent signs of a slight increase once again. The interplanetary magnetic field (IMF) was predominately Weak but briefly peaked at Moderate between 26/2050-2130 UTC. The north-south component has been mainly Weak and negative (southward) with only brief periods of positive (northward) direction. Geomagnetic activity was Quiet-Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar Activity is expected to be generally Low, but with a chance of isolated Moderate class flares.

Solar Wind / Geomagnetic Activity: CME from a common class flare on 26 Aug is forecast to arrive on day 4 (30 Aug), however this was only faintly observed and consequently confidence is Low for any notable impact or increase to geomagnetic activity. Some fast wind impact is expected during day 1 (27 Aug), with speeds potentially rising to slightly elevated levels 450-500km/s. Geomagnetic activity expected to remain generally Quiet to Unsettled, with likely Active intervals, but only a slight chance of G1 Minor Storms. Winds then expected to ease day 2 onward (28 Aug). Mainly Quiet geomagnetic activity then expected, with isolated Unsettled intervals. Any CME arrival on day 4 will likely bring a spell of Unsettled to Active, with a slight chance of G1 Minor Storms but confidence is low.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	15
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	25	25	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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